WHAT IS CLAIMED IS:

1. An inductance element produced from a laminate having electrical insulators and electrical conductors laminated alternately, said inductance element comprising a helical coil having a plurality of turns each constituted by four sides, wherein:

two of said four sides of each turn of the coil are formed as two parallel conductor pieces when said laminate is processed so that a plurality of slots are formed in said laminate or a plurality of grooves are formed in said laminate and bottoms of said grooves are removed;

said grooves formed in the laminating direction by said processing are filled with an electrically insulating material;

the other two sides of each turn of the coil are formed as two bridging conductor pieces which are formed on said electrically insulating material packed in said grooves so that end portions of said two parallel conductor pieces formed by said processing are connected to each other by said two bridging conductor pieces to thereby form said helical coil; and

top, bottom and side surfaces of said element are covered with electrically insulating layers respectively while external connecting terminal electrodes are provided on portions where part of said electrically insulating layers are removed.

2. An inductance element according to Claim 1, wherein said inductance element is formed as an array of inductance elements.

3. An inductance element according to Claim 1, wherein said inductance element has an antenna function.

4. An inductance element according to Claim 1, wherein said inductance element forms a transformer.

5. An inductance element according to Claim 1, wherein said electrical insulators, said electrically insulating material and said electrically insulating layers are made of either of a resin material and a composite material as a mixture of a resin and functional material powder.

6. An inductance element according to Claim 1, wherein said parallel conductor pieces are made of either of a metal plate and a sheet of metal foil whereas said bridging conductor pieces are formed by photolithography.

7. A laminated electronic component produced from a laminate having electrical insulators and electrical conductors laminated alternately, said laminated electronic component

comprising at least one inductance element, and at least one capacitance element as independent elements or as a composite inductance-capacitance element, wherein:

elements adjacent in a direction perpendicular to a laminating direction of said laminate are separated from each other by an electrically insulating material packed in a groove formed between said adjacent elements;

said inductance element includes a helical coil having a plurality of turns each constituted by four sides;

two of said four sides of each turn of the coil are formed as two parallel conductor pieces when said laminate is processed so that a plurality of slots are formed in said laminate or a plurality of grooves are formed in said laminate and bottoms of said grooves are removed;

said grooves formed in the laminating direction by said processing are filled with an electrically insulating material;

the other two sides of each turn of the coil are formed as two bridging conductor pieces which are formed on said electrically insulating material packed in said grooves so that end portions of said two parallel conductor pieces formed by said processing are connected to each other by said two bridging conductor pieces to thereby form said helical coil;

said capacitance element is formed so as to be separated from other elements by said grooves formed in said laminate and

said electrically insulating material packed in said grooves, said capacitance element including electrodes forming the same layers as those of said parallel conductor pieces of said coil, and conductors for connecting said electrodes to one another; and

top and bottom surfaces of said electronic component are covered with electrically insulating layers respectively while external connecting terminal electrodes are provided on an outer surface of said electronic component.

8. A laminated electronic component according to Claim 7, wherein said electrical insulators, said electrically insulating material and said electrically insulating layers are made of either of a resin material and a composite material as a mixture of a resin and functional material powder.

9. A laminated electronic component according to Claim 7, wherein said parallel conductor pieces are made of either of a metal plate and a sheet of metal foil whereas said bridging conductor pieces and said connecting conductors are formed by photolithography.

10. A laminated electronic component module with built-in elements formed in such a manner that a board having

electrical conductor layers formed therein is laminated on a layer made of either of a resin material and a composite material as a mixture of a resin and functional material powder, wherein:

said laminated electronic component module comprises, as one layer, at least one board containing at least one inductance element;

said inductance element-containing board is produced from a laminate having electrical insulators and electrical conductors laminated alternately;

said inductance element is made of a helical coil having a plurality of turns each constituted by four sides;

two of said four sides of one turn of said coil are formed as parallel conductor pieces when said laminate is processed so that grooves are formed in said laminate;

said grooves formed in the laminating direction by said processing are filled with an electrically insulating material; and

the other two sides of one turn of said coil are formed as bridging conductor pieces which are formed on the electrically insulating material packed in each groove so that end portions of said parallel conductor pieces formed by said processing are connected to one another by said bridging conductor pieces to form said helical coil.

11. A laminated electronic component module with built-in elements formed in such a manner that a board having electrical conductor layers formed therein is laminated on a layer made of either of a resin material and a composite material as a mixture of a resin and functional material powder, wherein:

said laminated electronic component module comprises, as one layer, at least one board containing at least one inductance element, and at least one capacitance element;

said inductance and capacitance element-containing board is produced from a laminate having electrical insulators and electrical conductors laminated alternately so that elements adjacent in a direction perpendicular to the laminating direction of said laminate are isolated from each other by an electrically insulating material packed in each groove formed between the elements;

said inductance element is made of a helical coil having a plurality of turns each constituted by four sides;

two of said four sides of one turn of said coil are formed as parallel conductor pieces when said laminate is processed so that grooves are formed in said laminate;

said grooves formed in the laminating direction by said processing are filled with an electrically insulating material;

the other two sides of one turn of said coil are formed as bridging conductor pieces which are formed on the electrically

insulating material packed in each groove so that end portions of said parallel conductor pieces formed by said processing are connected to one another by said bridging conductor pieces to form said helical coil; and

said capacitance element has electrodes, and a pair of electrical conductors for connecting electrodes to one another alternately, said electrodes formed as the same layers as the parallel conductor pieces of said coil when grooves are formed in said laminate.

12. A laminated electronic component module according to Claim 10, wherein the core direction of said coil of said inductance element is formed as a direction perpendicular to the laminating direction of said laminated electronic component module.

13. A method of producing inductance elements from a laminate having electrical conductor layers and electrical insulator layers laminated alternately in order to obtain inductance elements defined in any one of Claims 1 through 6, said method comprising the steps of:

preparing a quadrangular plate-like raw material having a number of electrical conductor layers corresponding to the number of turns in a plurality of inductance elements in a

laminating direction of said laminate and having a thickness corresponding to the thickness of one inductance element;

processing said raw material so that a plurality of first grooves each having a predetermined width for forming opposite sides of parallel conductor pieces of a helical coil are formed in a front surface of said raw material so as to be parallel with one another in said laminating direction while a plurality of second grooves for forming side portions of said helical coil are formed in the front surface of said raw material so as to be parallel with said first grooves;

filling said first and second grooves with an electrically insulating material;

grinding the front surface of said raw material filled with said electrically insulating material to thereby shape the front surface of said raw material;

grinding a rear surface of said shaped raw material to remove electrical conductors from the rear surface of said raw material to thereby form said parallel conductor pieces;

forming bridging conductor pieces on the front and rear surfaces of said raw material by photolithography to connect end portions of said parallel conductor pieces to one another by said bridging conductor pieces to form said helical coil while forming starting electrodes for terminal electrodes on either of the front and rear surfaces of said raw material by

photolithography;

covering the front and rear surfaces of said raw material having said bridging conductor pieces with an electrically insulating material and removing part of said electrically insulating material to reveal said starting electrodes to thereby form said terminal electrodes; and

cutting said raw material lengthwise and crosswise to thereby obtain said plurality of inductance elements.

14. A method of producing inductance elements from a laminate having electrical conductor layers and electrical insulator layers laminated alternately, said method comprising the steps of:

preparing a quadrangular plate-like raw material having a number of electrical conductor layers corresponding to the number of turns in a plurality of inductance elements in a laminating direction of said laminate and having a thickness corresponding to the thickness of one inductance element;

processing said raw material so that a plurality of first grooves each having a predetermined width for forming an inner circumferential portion of a helical coil are formed in a front surface of said raw material so as to be parallel with one another in said laminating direction;

filling said first grooves with an electrically insulating

material;

grinding the front surface of the raw material filled with said electrically insulating material to thereby shape the front surface of said raw material;

processing said raw material so that a plurality of second grooves for forming side portions of said helical coil are formed in the front surface of said raw material so as to be parallel with said first grooves;

filling said second grooves with an electrically insulating material;

grinding the front surface of the raw material filled with said electrically insulating material to thereby shape the front surface of said raw material;

grinding a rear surface of said shaped raw material to remove electrical conductors from the rear surface of said raw material to thereby form said parallel conductor pieces;

forming bridging conductor pieces on the front and rear surfaces of said raw material by photolithography to connect end portions of said parallel conductor pieces to one another by said bridging conductor pieces to form said helical coil while forming starting electrodes for terminal electrodes on either of the front and rear surfaces of said raw material by photolithography;

covering the front and rear surfaces of said raw material

having said bridging conductor pieces with an electrically insulating material and removing part of said electrically insulating material to reveal said starting electrodes to thereby form said terminal electrodes; and

cutting said raw material lengthwise and crosswise to thereby obtain said plurality of inductance elements.

15. A method of producing inductance elements from a laminate having electrical conductor layers and electrical insulator layers laminated alternately, said method comprising the steps of:

preparing a quadrangular plate-like raw material having a number of electrical conductor layers corresponding to the number of turns in a plurality of inductance elements in a laminating direction of said laminate and having a thickness corresponding to the thickness of one inductance element;

processing said raw material so that a plurality of first slots each having a predetermined width for forming opposite sides of parallel conductor pieces of a helical coil are formed in a front surface of said raw material so as to be parallel with one another in said laminating direction while a plurality of second slots for forming side portions of said helical coil are formed in the front surface of said raw material so as to be parallel with said first slots;

filling said first and second slots with an electrically insulating material;

grinding front and rear surfaces of said raw material filled with said electrically insulating material to thereby shape the front and rear surface of said raw material;

forming bridging conductor pieces on the front and rear surfaces of said raw material by photolithography to connect end portions of said parallel conductor pieces to one another by said bridging conductor pieces to form said helical coil while forming starting electrodes for terminal electrodes on either of the front and rear surfaces of said raw material by photolithography;

covering the front and rear surfaces of said raw material having said bridging conductor pieces with an electrically insulating material and removing part of said electrically insulating material to reveal said starting electrodes to thereby form said terminal electrodes; and

cutting said raw material lengthwise and crosswise to thereby obtain said plurality of inductance elements.

16. A method of producing laminated electronic components with built-in inductance and capacitance elements from a laminate having electrical conductor layers and electrical insulator layers laminated alternately, said method comprising

the steps of:

preparing a quadrangular plate-like raw material having a number of electrical conductor layers corresponding to the number of turns in a plurality of inductance elements in a laminating direction of said laminate, having a number of electrical conductor layers corresponding to the number of electrodes in a plurality of capacitance elements and having a thickness corresponding to the thickness of one inductance element/capacitance element;

processing said raw material so that a plurality of first grooves each having a predetermined width for forming opposite sides of parallel conductor pieces of a helical coil are formed in a front surface of said raw material so as to be parallel with one another in said laminating direction while a plurality of second grooves for separating elements from one another are formed in the front surface of said raw material so as to be parallel with said first grooves;

filling said first and second grooves with an electrically insulating material;

grinding the front surface of said raw material filled with said electrically insulating material to thereby shape the front surface of said raw material;

grinding a rear surface of said shaped raw material to remove electrical conductors from the rear surface of said raw

material to thereby form said parallel conductor pieces for said inductance elements;

forming bridging conductor pieces on the front and rear surfaces of said raw material by photolithography to connect end portions of said parallel conductor pieces to one another by said bridging conductor pieces to form said helical coil while forming starting electrodes for terminal electrodes and electrical conductors for connecting elements on either of the front and rear surfaces of said raw material by photolithography;

covering the front and rear surfaces of said raw material with an electrically insulating material and removing part of said electrically insulating material to reveal said starting electrodes to thereby form said terminal electrodes; and

cutting said raw material lengthwise and crosswise to thereby obtain said laminated electronic components with built-in inductance and capacitance elements.

17. A method of producing laminated electronic components with built-in inductance and capacitance elements from a laminate having electrical conductor layers and electrical insulator layers laminated alternately, said method comprising the steps of:

preparing a quadrangular plate-like raw material having a number of electrical conductor layers corresponding to the

number of turns in a plurality of inductance elements in a laminating direction of said laminate, having a number of electrical conductor layers corresponding to the number of electrodes in a plurality of capacitance elements and having a thickness corresponding to the thickness of one inductance element/capacitance element;

processing said raw material so that a plurality of first grooves each having a predetermined width for forming opposite sides of parallel conductor pieces of a helical coil are formed in a front surface of said raw material so as to be parallel with one another in said laminating direction;

filling said first grooves with an electrically insulating material;

grinding the front surface of said raw material filled with said electrically insulating material to thereby shape the front surface of said raw material;

processing said raw material so that a plurality of second grooves for separating elements from one another are formed in the front surface of said raw material so as to be parallel with said first grooves;

filling said second grooves with an electrically insulating material;

grinding the front surface of said raw material filled with said electrically insulating material to thereby shape the

front surface of said raw material;

grinding a rear surface of said shaped raw material to remove electrical conductors from the rear surface of said raw material to thereby form said parallel conductor pieces for said inductance elements;

forming bridging conductor pieces on the front and rear surfaces of said raw material by photolithography to connect end portions of said parallel conductor pieces to one another by said bridging conductor pieces to form said helical coil while forming starting electrodes for terminal electrodes and electrical conductors for connecting elements on either of the front and rear surfaces of said raw material by photolithography;

covering the front and rear surfaces of said raw material with an electrically insulating material and removing part of said electrically insulating material to reveal said starting electrodes to thereby form said terminal electrodes; and

cutting said raw material lengthwise and crosswise to thereby obtain said laminated electronic components with built-in inductance and capacitance elements.

18 A method of producing laminated electronic components with built-in inductance and capacitance elements from a laminate having electrical conductor layers and electrical insulator layers laminated alternately, said method comprising

the steps of:

preparing a quadrangular plate-like raw material having a number of electrical conductor layers corresponding to the number of turns in a plurality of inductance elements in a laminating direction of said laminate, having a number of electrical conductor layers corresponding to the number of electrodes in a plurality of capacitance elements and having a thickness corresponding to the thickness of one inductance element/capacitance element;

processing said raw material so that a plurality of first slots each having a predetermined width for forming opposite sides of parallel conductor pieces of a helical coil are formed in a front surface of said raw material so as to be parallel with one another in said laminating direction while a plurality of second slots for separating elements to one another are formed in the front surface of said raw material so as to be parallel with said first slots;

filling said first and second slots with an electrically insulating material;

grinding front and rear surfaces of said raw material filled with said electrically insulating material to thereby shape the front and rear surface of said raw material;

forming bridging conductor pieces on the front and rear surfaces of said raw material by photolithography to connect

end portions of said parallel conductor pieces to one another by said bridging conductor pieces to form said helical coil while forming starting electrodes for terminal electrodes and electrical conductors for connecting elements on either of the front and rear surfaces of said raw material by photolithography;

covering the front and rear surfaces of said raw material with an electrically insulating material and removing part of said electrically insulating material to reveal said starting electrodes to thereby form said terminal electrodes; and

cutting said raw material lengthwise and crosswise to thereby obtain said laminated electronic components with built-in inductance and capacitance elements.

19. A method of producing a laminated electronic component module having electrical conductor layers formed on a layer made of either of a resin material and a composite material as a mixture of a resin and functional material powder, said method comprising the steps of:

forming, as a core board, a laminated electronic component including at least one inductance element among inductance and capacitance elements, and external connecting conductors formed in either of front and rear surfaces, said inductance element formed as a helical coil having parallel conductor pieces, and bridging conductor pieces formed by photolithography to connect

end portions of said parallel conductor pieces to one another by said bridging conductor pieces; and

forming said laminated electronic component module by repeating a process of laminating sheets of prepreg and conductor foil on at least one of the front and rear surface of said core board, curing said prepreg, forming conductor patterns by etching and connecting layers to one another.